Unsaturated Fatty Acids in Rye Plants

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In this laboratory an antifungal, weakly acidic substance was recently isolated from intact rye seedlings by Wahlroos and Virtanen[1]. The elementary analysis of the substance was best in accordance with the molecular formula $C_{16}H_{26}O_2$ or $C_{16}H_{28}O_2$. The ready autoxidation of the substance could, however, have influenced the analytical results.

We have continued the investigation of this ether-soluble, weakly acidic fraction of rye plants. A large amount of plant material was used for the isolation of the fraction in adequate amounts. When purified in the countercurrent distribution apparatus described by Hietala[2], it appeared that the fraction was a mixture containing unsaturated fatty acids, chiefly linoleic and linolenic acids. The difference between the earlier calculated molecular formula and that of linoleic ($C_{18}H_{32}O_2$) or linolenic acids ($C_{18}H_{30}O_2$) may have been due to the autoxidation of the isolated compounds.

It is not yet known how large a part of these unsaturated fatty acids in the rye plant exists in the free state and how large a part in the combined form. Garton[3] reported recently that more than 75 per cent of the fatty acids isolated from the lipides of pasture grasses are unsaturated C_{18} acids and that the outstanding component is linolenic acid. Weenink[4] has shown that about 60 per cent of the lipid fraction of New Zealand grasses consists of galactosyl glyceryl esters of fatty acids, largely of linolenic acid. The work on the composition of the lipid fraction which contains these unsaturated fatty acids is being continued. Linoleic acid and linolenic acid prevent the growth of *Fusarium nivale* on an oat meal agar plate to 50% in a concentration of about 1.5 mg/ml.

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References

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3. Garton, G. *Nature* **187** (1960) 511.
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